

Effects and Remedies of Construction Claims in Hydropower Projects: Case Studies of Selected Medium-Scale Hydropower Projects in Nepal

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Abstract

This research aims to analyze the perspectives of various stakeholders involved in hydropower projects, including employers, engineers, and contractors, to identify common challenges and propose strategies for minimizing claims. The data analysis involved a questionnaire survey conducted among representatives of employers, engineers, and contractors across seven selected hydropower projects. Similar questionnaires were distributed to gather insights from all three parties involved in the projects. The responses were compiled and analyzed collectively using a general ranking method, allowing for a comprehensive assessment of the findings related to the thesis objectives. The analysis revealed that claims significantly impact construction projects, manifesting as both cost overruns and time delays. If not addressed promptly, these claims can escalate into disputes that typically require resolution through Alternate Dispute Resolution (ADR) procedures or may lead to complex legal proceedings. The study identified several key factors contributing to claims, including inadequate tender documentation, poor record-keeping of daily site events, and the occurrence of major design changes. To mitigate the risks associated with claims in hydropower projects, it is essential to implement several best practices: preparing clear and unambiguous tender documents, maintaining comprehensive daily records of site activities, minimizing design changes whenever possible, ensuring site possession prior to contractor mobilization, and conducting thorough field investigations before finalizing designs.

Keywords: alternative disputes, effects, measures, hydropower, projects

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Introduction

Hydroelectric power projects are crucial for Nepal's energy security and economic development. However, these projects are often plagued by disputes that can significantly impact their timely and cost-effective completion (Acharya & Dai Lee, 2006; Agrawal et al., 2016).

Nepal's hydroelectric power projects involve multiple stakeholders, including government agencies, contractors, and suppliers, each with their

own interests and expectations. This complexity can lead to disputes, which can be costly and time-consuming to resolve. The literature suggests that disputes in construction projects are common and can arise from various factors such as scope changes, poor contract documentation, restricted access, unforeseen ground conditions, and contractual ambiguities (Agrawal et al., 2016; National Research Council, 2007; Changali et al., 2015; Gibson, 2007).



Current State of Disputes in Hydro Power Projects

Previous studies have highlighted the prevalence of disputes in Nepal's construction projects, including those related to focusing more on road projects in comparison to that of hydroelectric power (Changali et al., 2015; Gibson, 2007; Enshassi et al., 2008; FIDIC, 1999; Hewitt, 2016). For instance, Mishra and Aithal (2023) evaluated the impact of disputes on the time and cost of projects, emphasising the need for effective dispute resolution mechanisms.

Mishra and Magar (2017) and Mishra and Aithal (2022) assessed the planning and implementation of transport infrastructure projects in Nepal, which can be affected by disputes (Mishra & Magar, 2017; Mishra Aithal, 2022). Mishra and Aithal examined the effectiveness of arbitration in resolving disputes in construction projects, providing insights into alternative dispute resolution methods (Mishra & Aithal, 2022). Mishra et al. identified the causes of disputes in international competitive bidding road contracts funded by the Asian Development Bank in Nepal, highlighting the prevalence of disputes in such projects (Mishra et al., 2022). Mishra specifically focused on the dispute resolution practises in project management in Nepal, assessing the use of alternative dispute resolution methods such as negotiation, adjudication, mediation, and arbitration (Mishra, 2022). Mishra et al. in 2020 and 2021 and Sauden et al. in 2022 explored various aspects of project management in Nepal, including the operational assessment of public transport, foreign aid movements, and the assessment of seeds of disputes in projects (Mishra et al., 2020; Mishra et al., 2021; Mishra 2022).

Mishra et al. analysed the time and cost performance status of the Sikta Irrigation Contract, providing insights into the impact of disputes on project performance (Mishra et al., 2021). Mishra and Moktan identified constraints in project schedule management, which can contribute to disputes and delays in project completion. a study on the dispute resolution practises in international competitive bidding road contracts funded by the

Asian Development Bank found that disputes were common and often took years to resolve, resulting in significant time and cost overruns (Mishra Moktan, 2019). Another study evaluated the impact of disputes on time and cost of projects, emphasising the need for effective dispute resolution mechanisms (Enhassi et al., 2008; FIDIC, 1999; Hewitt, 2016; Mishra et al., 2017; Mishra & Aithal, 2022; Mishra & Aithal, 2022; Mihra et al., 2022).

Problem Statement

Claims are obvious in any construction project and it is found more in hydropower construction projects because of its complex nature in construction works and due to varieties of works within it. During the course of its construction, several questions are raised. Unseen factors and sometimes unforeseen matters arise beyond the contractual parameters which ultimately drive the parties to claim. Sometimes, the obligation from both parties is not fulfilled as a result the party who thinks is affected will go for the claim. Claims in different cases have become a big headache in projects, generally, claims from the contracting parties against each other have created difficulties in the proper execution of the project taking the project to time overrun and cost overrun and even in some cases a failure of the project. Having knowledge of different construction claim types will help the investors/ owners/ employers and the contractors to recognise possible and potential claim situations. This recognition can protect the owners/ contractors from incurring losses help in recovering compensation and also assist in forecasting the possible claims in the projects during its implementation period. In this context, as there are many issues which are related to construction claims, it is necessary and important thing that countries like Nepal should have more studies regarding the claim.

The findings will provide insights into the current state of disputes in hydropower projects and inform strategies for improving dispute resolution practices.

Research Objective

The objective of this research paper is to provide a comprehensive assessment of the

current state of disputes in hydropower projects of Nepal and obtain the possible effects of claims in hydropower projects of Nepal.

Methodology

The research is conducted from 2020 to 2023 years. The methodology used in this research study involves a combination of quantitative and qualitative approaches to achieve the objectives of identifying the causes, effects, and measures to minimize claims in hydropower projects in Nepal.

Literature Review

A comprehensive review of books, journals, and research papers related to the research topic was conducted to analyse and develop an understanding of the common causes of claims in the construction industry.

Case Study

Seven hydropower projects under construction and recently completed projects were selected randomly for the study. Key personnel from the employer, consultant, and contractor were selected as sample respondents.

Experts' Opinion

The opinions of experts in the field were also considered to gain a deeper understanding of the causes and effects of claims.

Data Collection

Primary Data

Questionnaires were prepared to collect primary data from the staff directly involved in project contract administration. The main sources of the questionnaire were previous studies (Mishra & Aithal, 2023; Isreal, 1992; Kayastha, 2006; Khekale & Futane, 2015; Ministry of Water Resources, 2001; Tamang et al., 2024; Menkel-Meadow, 2013; Martinkova et al., 2004; Griffin, 1992; Authority, 2016; Public Procurement Act, 2007; Public Procurement Regulation, 2007; Reilly, 1999; Tamang et al., 2024; Sharma, 2005; Shen et al., 2017; Changali et al., 2015; Whitticks, 2013; ADB and IDB, 2016)

Secondary Data

Technical and related data were collected from corporate offices and site offices of the respective projects.

Data Analysis

General Ranking Method: The responses from the representatives of all three parties (employer, consultant, and contractor) were compiled and analysed using the general ranking method.

Research Matrix

The summary of the research methodology is presented in Table 1.

Table 1

Summary of the Research Methodology

Objectives	Data required	Collection Methods	Analysis	Outcomes
To obtain the effects of the claim	Consequence/ effects due to the claim in the study area	Literature review, questionnaires, cases in projects	General ranking	Effects
To identify the measures to minimise claims	Different measures applied to minimise claims in hydropower projects	Literature review, questionnaire, cases in the projects	General ranking	Measures

Results and Discussion

Effects of Claim

An attempt has been made to rank the effects of claims made in the construction contracts (Figure

1). In order to obtain the opinion to find the effects of the claims, responses are collected through the questionnaire from the employers, engineers, and contractors. The responses have been described in Table 2.

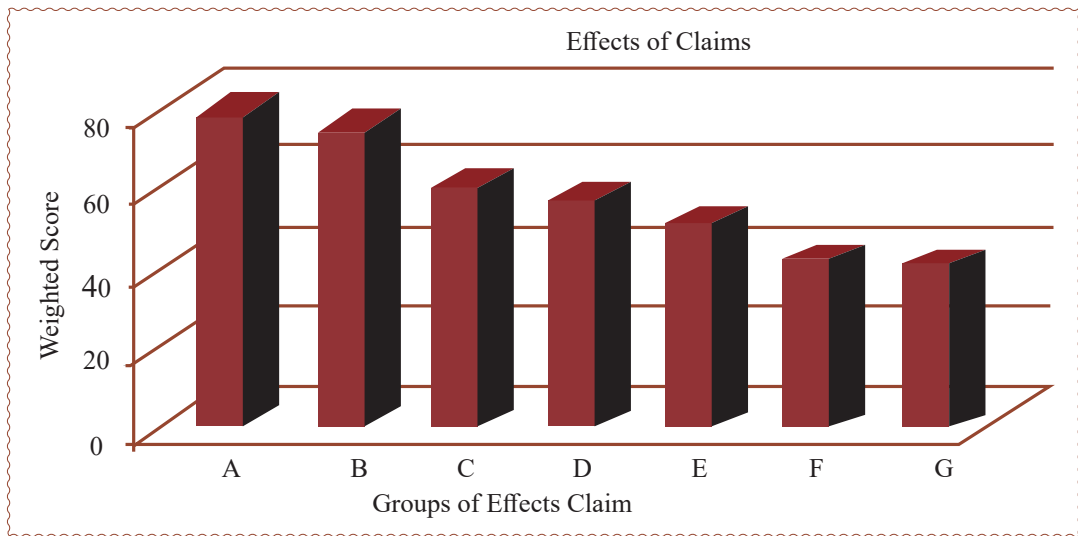
Table 2

Effects of Claim

SN	Effects of Claims	Frequency of Each Weighted No. 1 to 7							Total Score	Rank	Group
		1	2	3	4	5	6	7			
1	Cost overrun	8	3		1				78	I	A
2	Time overrun	3	8	1					74	II	B
3	Litigation	1	4	4	1	1			58	III	C
4	Loss of company reputation			3	2	4	1	1	38	VII	G
5	Reduction of respect between parties	1		4	4	1	1		48	V	E
6	Extended and/ or more complex award process	1	4	3	2				54	IV	D
7	Loss of professional reputation	1		3	3		1	3	39	VI	F

Figure 1

Effects of Claim



According to the questionnaire survey, the first ranked effect of claims is observed to be the cost overrun which is followed by the time overrun. The third-ranked effect of the claim is found to be litigation.

Measures to Minimise Claims

An attempt has been made to rank the measures to minimise claims in the construction

contracts (Figure 2). In order to know the points to minimise claims, responses are collected through the questionnaire from the employers, engineers, and contractors. The responses are described below in Table 3.

Table 3*Measures to Minimise Claims*

SN	Measures to Minimise Claims	Total Score	Rank	Group
1	Use the best-value approach in bid selection, as opposed to a low bid process.	53	I	A
2	Understand and deal realistically with site conditions.	48	II	B
3	Set up controls that will minimise the frequency and severity of problems.	46	III	C
4	Develop concise specifications and drawings based on national codes.	45	IV	D
5	Establish a cooperative project environment, with leadership from the top.	42	V	E
6	Choose the most appropriate project delivery and management method.	40	VI	F
7	Use benchmarking and feedback to measure results, improve processes and performance, and build an atmosphere of trust with project participants; and + Use functionally integrated owner teams to oversee contractor work and take action when problems arise. +Assign project risk to the party that is best able to manage, control, and insure against the risk.	38	VII	G
8	Pay invoices in a timely manner to avoid friction among project participants.	36	VIII	H
9	Hold separate meetings to discuss solutions and “who pays” when resolving issues on the critical path.	35	IX	I
10	Provide for a “backstop” combination of mediation and, as the final resort, arbitration before expert construction industry arbitrators.	33	X	J
11	Use commercial standards to the extent possible because unique requirements discourage firms from bidding on the project.	31	XI	K
12	Provide adequate authority at the job site so that decisions can be made quickly when something unexpected happens.	25	XII	L

According to the questionnaire survey, the first ranked measure to minimise the claim is found to be to use a best value approach in bid selection as opposed to a low bid process. Similarly, the second rank is observed as it has to be understood that the site conditions were required to be properly investigated before the procurement of the works. Likewise, to set up controls that will minimise the frequency and severity of problems, developing concise specifications and drawings based on national codes came in third and fourth rank as the measures. Disputes in construction projects are

inevitable, but they can be minimised by adopting effective dispute-resolution practices. According to Mishra and Aithal, building ethical capital through human resources is crucial in minimising disputes (Mishra & Moktan, 2019). This involves fostering a culture of transparency, accountability, and open communication among stakeholders. Additionally, Mishra and Aithal emphasise the importance of considering the ethical implications of the recruiting process to ensure that the right candidates are selected for the project (Mishra & Aithal, 2022). Mishra et al. highlight the

effectiveness of preventive and control measures in safety implementation, which can help minimize disputes related to accidents and injuries (Mishra et al., 2019). Furthermore, Mishra et al. suggest that assessing the time-cost model of public health buildings in Nepal can help identify potential issues and minimise disputes related to project timelines and budgets (Mishra et al., 2021). By adopting these strategies, construction projects can be managed more effectively, reducing the likelihood of disputes and ensuring timely and cost-effective completion (Mishra et al., 2018; Mishra Aithal, 2023; Zack Jr, 1993).

Recommendations for the Hydropower Project Implementation

Based on the research findings, the following recommendations are made.

1. Use a best-value approach in bid selection, as opposed to a low bid process. The pre-qualification criteria should be made stringent with assessing the contractor's technical and management capabilities strictly.
2. Since variations, design changes, and differing site conditions lead to claims; there should be a thorough investigation and sufficient studies for project selection during the study phase.
3. One of the major causes of claims is found to be due to unavailability of site possession or not having access to the site even after the award of the contract, for this particular reason, the site possession and access of the site to the contractor is a must before the mobilisation of contractor in the site.
4. The possible areas of landslide should be anticipated before awarding a contract so that proper scheduling and costing are estimated for such problems if occurred during the execution of the project. This will also help to proceed with undertaking the preventive measures against landslides.

5. Hydropower projects can have an impact on local communities and the environment at any time during the project execution period, so promote local communities in education, health, and their socio-economic-cultural aspects, provide jobs to the locals in the project, work with close coordination with the project affected locals, also invests in local communities to prevent and mitigate adverse social and environmental impacts. This will help to mitigate the local strikes during project implementation and also will give positive feedback to the project from the local communities.
6. The claim is inevitable in any construction project and if the claim goes under dispute, the in-house settlement or amicable settlement should be given the highest priority, negotiation, and mediation should be preferred before proceeding towards arbitration and litigation, and the claim if found valid and legitimate, it should be settled amicably.

Recommendations for Further Studies

The results obtained in this study were constrained by the various limitations of the study. The following recommendations are made for further study.

1. The claims are inevitable in the construction of hydropower projects. Therefore, a study on the claim minimisation strategy for hydropower projects is recommended for further study.
2. The claims have adverse impacts on the smooth and effective implementation of the projects like delay in the project and tremendous increase in the cost of the project. So, a study relating to the effect of delays and causes of claims in terms of time and cost overrun is also recommended for further study.

Conclusion

Effects of Claims

In the long run, the claim in the construction industry generally converts into a dispute which ultimately creates the status of disbelief among the contracting parties. The dispute may be required to be resolved finally through litigation. Claims on the one hand are inevitable in any project but on the other hand, the claims may harm the parties in different ways if the claims are not handled properly. The effects of claims are found to be cost overrun and time overrun in the projects. The litigation process may be a lengthy and time-consuming process after parties face disputes due to claims. Also, loss of company reputation, reduction of respect between parties, extended and/ or more complex award process and loss of professional reputation of the contracting parties are found to be the effects of the claim. Effects of claims are not good at all, hence it is very necessary to have good contractual provisions in the contract to resolve the claim issues in a timely manner and there should be good understanding and strong determination among the contracting parties to reduce the claims.

Measures to Minimise Claims

The properly structured and clearly defined provisions of the contract document are one of the solutions to reduce/ avoid any claims/ disputes in the construction project as it helps to function and manage properly the overall contract administration procedures including the performance of respective obligations of the employer, engineer and contractors under the contract. From the listed different causes and effects of the claim, it is evident that the bidding document is to be prepared based on the detailed investigation and detailed design of the project in order to avoid/ reduce the possible claims that may be encountered during the execution of the project and accordingly contract should be awarded to the best bidder but not necessarily the lowest bidder. The best-suited general contract condition is required to be adopted for any particular contract

and this should be supplemented/ supported by defining the important clauses properly as required with the employer's requirements which should be ensured in the particular condition of the contract. It is also to be ensured that any provisions of the contract document are not vague and do not provide dual meaning.

Based on the study, in order to minimise claims the measures that have to be followed are; while selecting the bid is to use a best value approach in bid selection as opposed to a low bid process, it is to be understood and dealt with realistically with site conditions before preparing a tender document and concise specifications and drawings based on national codes are to be developed. Besides following points are also to be followed to minimise claims.

1. Conduct thorough investigations and studies for project selection and detailed design.
2. Complete detailed design and detailed estimating of costing before contract award.
3. Ensure that the bill of quantities is realistic and based on design and site condition.
4. Avoid major design changes during construction unless it is very necessary.
5. Make sure that the site possession is guaranteed before the mobilisation of the Contractor.
6. During planning, conduct a thorough analysis of site conditions and engage adequate third-party verification.
7. Ensure proper provisions and proper contract language in the contract for allocating the risk of force majeure, unforeseen conditions, differing conditions, and weather, flood, and schedule delays.

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